

Industry Curriculum Framework Information Package

Metal and Engineering 2007

For 2007 implementation

Current as at 20 March 2008

Please ensure that this is the most current version of this document by referring to the online version at
https://detwww.det.nsw.edu.au/directorates/vet_schools/vet-in-Schools/frameworks.html

Contents

Teacher training requirements.....	3
Qualification benchmark.....	3
Approved training program – Metal and Engineering	3
Maintaining industry currency	5
Qualifications and industry experience	5
Assessor qualifications.....	5
Using qualified assessors	5
Resource/equipment requirements	8
Resources for compulsory competencies in the 120 / 240 hours courses	8
Resources for elective competencies in the 120 / 240 hours courses.....	12
Resources for elective competencies in the 60 / 120 hours specialisations.....	19
Quality assurance requirements.....	20
Metal and Engineering Checklists	22
1. Teacher qualifications	22
2. Student work placement.....	23
3. Student assessment.....	23
4. Resources/equipment	24

Metal and Engineering

This section must be read in conjunction with the:

- Board of Studies Metal and Engineering Syllabus (Parts A & B)
- Board of Studies ACE Manual
- Workplace Learning Handbook

The following information is provided for the Metal and Engineering industry curriculum framework:

- Teacher training requirements
- Assessor qualifications
- Using qualified assessors
- Resource/equipment requirements
- Quality assurance requirements

Checklists

- Teacher qualifications
- Student work placement
- Student assessment
- Resources/equipment

Teacher training requirements

Qualification benchmark

A teaching qualification with a subject specialisation:

Industrial Arts.

Eligibility to teach nominated units of competency is achieved on:

recognition of individual qualifications, industry experience or other training (RPL)

and/or

satisfactory completion of **the approved training program**.

Approved training program – Metal and Engineering

Approved teacher training program	Duration
Orientation Curriculum framework/syllabus orientation, competency based teaching and assessment, facilitating workplace learning.	2 days
Industry specific training	5 days
Industry placement	2 days
Certificate IV in Training and Assessment	Flexible

Teachers completing this training program are eligible to deliver and assess the following units of competency in the Metal and Engineering Curriculum Framework course.

Compulsory units of competency for 240-hour course

N/A	Manufacturing, engineering and related services industries induction
MEM09002B	Interpret technical drawing
MEM12023A	Perform engineering measurements
MEM12024A	Perform computations
MEM13014A	Apply principles of occupational health and safety in the work environment ¹
MEM14004A	Plan to undertake a routine task
MEM15002A	Apply quality systems
MEM15024A	Apply quality procedures
MEM16007A	Work with others in a manufacturing, engineering or related environment
MEM18001C	Use hand tools
MEM18002B	Use power tools/hand held operations

Electives for 240-hour course

MEM03001B	Perform manual production assembly
MEM03003B	Perform sheet and plate assembly
MEM04018B	Perform general woodworking machine operations

¹ Learning experiences for the HSC for this unit of competency must be undertaken prior to work placement.

MEM05003B	Perform soft soldering
MEM05004C	Perform routine oxy acetylene welding
MEM05005B	Carry out mechanical cutting
MEM05006B	Perform brazing and/or silver soldering
MEM05007C	Perform manual heating and thermal cutting
MEM05012C	Perform routine manual metal arc welding
MEM05050B	Perform routine gas metal arc welding
MEM05051A	Select welding processes
MEM05052A	Apply safe welding practices
MEM07032B	Use workshop machines for basic operations
MEM11011B	Undertake manual handling
MEM12001B	Use comparison and basic measuring devices
MEM16005A	Operate as a team member to conduct manufacturing, engineering or related activities
MEM16006A	Organise and communicate information
MEM16008A	Interact with computing technology
MEM18055B	Dismantle, replace and assemble engineering components

Specialisation Study units of competency

MEM05001B	Perform manual soldering/de-soldering – electrical/electronic components
MEM07005B	Perform general machining
MEM09003B	Prepare basic engineering drawing
MEM15001B	Perform basic statistical quality control
MEM15003B	Use improvement processes in team activities

Teachers wishing to deliver any units of competency from the specialisation study that are not listed above must:

- Have achieved the unit(s) of competency and hold a transcript for the unit(s) of competency
- Discuss the delivery of the unit(s) of competency with their vocational education consultant **prior** to delivery
- If delivery is supported by the RTO, provide a copy of the transcript for the unit(s) of competency to their school sector to obtain additional accreditation and approval to deliver the requested unit(s) of competency

Maintaining industry currency

The requirement for current knowledge will be met initially through completion of the approved teacher training program. Thereafter it is the responsibility of individual teachers to maintain industry currency.

Teachers can maintain industry currency through:

- industry contact and liaison
- collegial networks with a professional development focus
- interaction with colleagues through the VET teachers' website at www.govet.nsw.edu.au.

Contact the regional vocational education consultant for more information.

Qualifications and industry experience

Teachers who have recent and relevant qualifications or experience may seek entry to, or exemption from, some components of training or may claim eligibility to teach additional units of competency through the process of recognition of prior learning (RPL). All teachers are required to complete an orientation program.

Teachers who are accepted into the training program can seek exemptions from any or all of the components of the training program via RPL. Applications must be supported by primary documented evidence of recent and relevant experience and/or qualifications, mapped against the competencies to be delivered in schools.

Assessor qualifications

Consistent with VETAB requirements, the NSW Department of Education and Training, Catholic Education Commission and Association of Independent Schools require that all staff assessing training package qualifications hold a Certificate IV in Training and Assessment TAA40104 (or Certificate IV Assessment and Workplace Training BSZ40198). Teachers can gain this qualification through an approved teacher training program or through a process of recognition from an external RTO.

Prospective teachers who already hold Certificate IV in Training and Assessment TAA40104 (or Certificate IV Assessment and Workplace Training BSZ40198) should send a copy to the region or diocese VET consultant as evidence of the qualification.

Using qualified assessors

Assessment for national recognition purposes (qualifications) must be undertaken by, or partnered through, a Registered Training Organisation (RTO). It is the RTO's responsibility to make arrangements and to ensure that a quality assessment process is in place.

The following outlines the different ways that the requirement to use qualified assessors may be met.

Single Assessor – an individual assessor conducts the assessment

An Assessor is:

- required to hold formal recognition of competence in the relevant units in the Training and Assessment Training Package;
- deemed competent and, where possible, holds formal recognition of competence in the specific units of competency in this Training Package, at least to the level being assessed.

In addition, it is recommended that the assessor is able to:

- demonstrate current knowledge of the industry, industry practices, and the job or role against which performance is being assessed;
- demonstrate current knowledge and skill in assessing against this Training Package in a range of contexts; and
- demonstrate the necessary interpersonal and communication skills required in the assessment process.

Partnership arrangement – an assessor works with a technical expert to conduct the assessment

An Assessor is required to:

hold formal recognition of competence in the relevant units in the Training and Assessment Training Package.

In addition, it is recommended that the assessor is able to:

- demonstrate current knowledge and skill in assessing against this Training Package in a range of contexts; and
- demonstrate the interpersonal and communication skills required in the assessment process.

A technical expert shall be a person who is:

- deemed competent and, where possible, hold formal recognition of competence in the specific units of competency from this Training Package, at least to the level being assessed.

In addition, it is recommended that the technical expert is able to:

- demonstrate current knowledge of the industry, industry practices, and the job or role against which performance is being assessed;
- communicate and liaise with the assessor throughout the assessment process.

Partnership arrangement – an assessor works with workplace supervisor in collecting evidence for valid assessment

An assessor is required to:

- hold formal recognition of competence in the relevant units in the Training and Assessment Training Package; and
- make the assessment decisions.

In addition, it is recommended that the assessor is able to:

- demonstrate current knowledge and skill in assessing against this Training Package in a range of contexts;
- demonstrate the interpersonal and communication skills required in the assessment process;
- communicate and liaise, where appropriate, with the workplace supervisor throughout the assessment process.

A workplace supervisor is required to:

- be deemed competent and, where possible, is to hold formal recognition of competence in the specific units of competency from this Training Package, at least to the level being assessed.

In addition, it is recommended that the workplace supervisor is able to:

- demonstrate current knowledge of the industry, industry practices, and the job or role against which performance is being assessed;
- communicate and liaise, where appropriate, with the assessor throughout the assessment process; and
- use agreed practices to gather and record evidence for the assessor to use in making a valid judgment on competency.

Assessment team/panel – a team or panel working together to conduct the assessment

Members of an assessment team or panel that comprises assessment and industry experience and expertise works together in the collection of evidence and in making judgments about competency.

The members of the team must include at least one person who:

- holds formal recognition of competence in the relevant units of the Training and Assessment Training Package;
- is deemed competent and, where possible, holds formal recognition of competence in the specific units of competency from this Training Package, at least to the level being assessed.

In addition, it is recommended that members of the assessment team or panel involved in the assessment are able to:

- demonstrate current knowledge of the industry, industry practices, and the job or role against which performance is being assessed;
- demonstrate current knowledge and skill in assessing against this Training Package in a range of contexts;
- demonstrate the interpersonal and communication skills required in the assessment process and liaise with other team/panel members throughout the assessment process.

Resource/equipment requirements

Schools delivering units of competency in the Metal and Engineering Framework must have access to specific resources/equipment. Students must have sufficient access to the specified resources/equipment to enable them to acquire and demonstrate competency. The following resources/equipment are required to deliver and assess the units of competency. Resources/equipment may be accessible either on-site (at school) or off-site (including the work placement).

Resources for compulsory competencies in the 120 / 240 hours courses

MEM09002B Interpret technical drawing
Assessment of this unit requires that the candidate have access to all tools, equipment, materials and documentation indicated below. In the case of this compulsory HSC unit, please check HSC Requirements and Advice column in Part B of the Board of Studies syllabus for any specified range of resources and equipment.
Tools, equipment and resources <ul style="list-style-type: none"> • Access to Australian Standard 1100.101, with specific focus on AS1100 to align with standard operating procedures. • Geometric reference materials to ensure appropriate units of measurement used. • Access to relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
Site requirements Appropriate workspace
MEM12023A Perform engineering measurements
Assessment of this unit requires that the candidate have access to all tools, equipment, materials and documentation indicated below. In the case of this compulsory HSC unit, please check HSC Requirements and Advice column in Part B of the Board of Studies syllabus for any specified range of resources and equipment.
Tools, equipment and resources <ul style="list-style-type: none"> • Measuring devices from a range that is typical of manufacturing, engineering and related environments which should include: protractors, combination squares, set squares, dial indicators, tapes, rules, micrometers, vernier-scaled measuring equipment and may include other specialist tools such as thermometers etc. • Calculating equipment • Recording equipment typical of the workplace for recording task/project measurements and calculations
Site requirements Appropriate workspace

MEM12024A Perform Computations

Assessment of this unit requires that the candidate have access to all tools, equipment, materials and documentation indicated below. In the case of this compulsory HSC unit, please check HSC Requirements and Advice column in Part B of the Board of Studies syllabus for any specified range of resources and equipment.

Tools, equipment and resources

- Diagrams, drawings, measurement data, reference manuals and specifications relevant to the workplace.
- Access to relevant workplace procedures, codes, standards guides.
- Calculating equipment
- Recording materials that allow for the creation of simple histograms, control charts, pie charts, line graphs, column graphs, etc, and materials to create documentation typical of the workplace for recording task/ project calculations.

Site requirements

Appropriate workspace

MEM13014A Apply principles of occupational health and safety in the work environment

Assessment of this unit requires that the candidate have access to all tools, equipment, materials and documentation indicated below. In the case of this compulsory HSC unit, please check HSC Requirements and Advice column in Part B of the Board of Studies syllabus for any specified range of resources and equipment.

Tools, equipment and resources

- First aid kit - Kit B as per NSW WorkCover requirements
- Personal protective equipment including but not limited to safety glasses, face and head protection, hard hats, protective footwear, protective clothing, breathing apparatus, ear protection, gloves
- Safety equipment and devices including but not limited to safety harness, screens, barriers and shielding, extraction fans, machine guards, isolation devices.
- Safety signs/symbols conforming to AS1319 – 1994: Safety signs for the occupational environment, and any other applicable Australian Standards workplace specific signage. Typical classes of relevant signs/symbols are: mandatory, prohibition, danger, caution, general safety, safety information, fire safety equipment.
- Access to relevant workplace procedures, product and manufacturing specifications, Material Safety Data Sheets (MSDS), codes, standards, manuals and reference materials

Site requirements

Appropriate workspace

MEM14004A Plan to undertake a routine task

Assessment of this unit requires that the candidate have access to all tools, equipment, materials and documentation indicated below. In the case of this compulsory HSC unit, please check HSC Requirements and Advice column in Part B of the Board of Studies syllabus for any specified range of resources and equipment.

Tools, equipment and resources

Access to a range of sources for work instructions and procedures including:

- Work schedules, job card/sheet/plans/specifications, standard operating procedures (SOP), standard operation sheets, Material Safety Data Sheets (MSDS), diagrams/sketches, regulations/legislation, manufacturer/workplace guidelines, policies and procedures, Australian Standards.
- Reference materials to assist in the identification and implementation in the workplace of dedicated tools and equipment, materials and parts, work procedures, completion time, safety measures and equipment.
- First aid kits and basic firefighting equipment (blankets, extinguishers, hydrant and hose)

Site requirements

Appropriate workspace

MEM15002A Apply quality systems

Assessment of this unit requires that the candidate have access to all tools, equipment, materials and documentation indicated below. In the case of this compulsory HSC unit, please check HSC Requirements and Advice column in Part B of the Board of Studies syllabus for any specified range of resources and equipment.

Tools, equipment and resources

- Access to reference material to identify quality systems terminology and concepts. Specifically these should allow for a range of sources for work instructions and procedures including work schedules, job card/sheet/plans/specifications, standard operating procedures (SOP), standard operation sheets, Material Safety Data Sheets (MSDS), diagrams/sketches, regulations/legislation, manufacturer/workplace guidelines, policies and procedures, Australian Standards.

Site requirements

Appropriate workspace

MEM15024A Apply quality procedures

Assessment of this unit requires that the candidate have access to all tools, equipment, materials and documentation indicated below. In the case of this compulsory HSC unit, please check HSC Requirements and Advice column in Part B of the Board of Studies syllabus for any specified range of resources and equipment.

Tools, equipment and resources

- Access to reference material to reference material to assist in the identification and implication of a range of sources for work instructions and procedures including work schedules, job card/sheet/plans/specifications, standard operating procedures (SOP), standard operation sheets, Material Safety Data Sheets (MSDS), diagrams/sketches, regulations/legislation, manufacturer/workplace guidelines, policies and procedures, Australian Standards.
- Access to reference material to reference material to help identify customer/ supplier relationships

Site requirements

Appropriate workspace

MEM16007A Work with others in a manufacturing, engineering or related environment

Assessment of this unit requires that the candidate have access to all tools, equipment, materials and documentation indicated below. In the case of this compulsory HSC unit, please check HSC Requirements and Advice column in Part B of the Board of Studies syllabus for any specified range of resources and equipment.

Tools, equipment and resources

- Access to reference materials to assist in the development of personal attributes, interpersonal skills and communication skills consistent with industry expectations. These include the development of basic listening and speaking skills, use of terminology and jargon, giving and receiving feedback, interpreting instructions, verbal and non-verbal modes and methods of communication, basic principles of effective communication.

Site requirements

Appropriate workspace

MEM18001C Use hand tools

Assessment of this unit requires that the candidate have access to all tools, equipment, materials and documentation indicated below. In the case of this compulsory HSC unit, please check HSC Requirements and Advice column in Part B of the Board of Studies syllabus for any specified range of resources and equipment.

Tools, equipment and resources

- Tools *may include* various hand tools, including but not limited to hacksaws, hammers, punches, screwdrivers, spanners, sockets and keys, wrenches, scrapers, chisels, gouges, wood planes, files of all cross-sectional shapes and types.
- Access to reference materials which outline relevant workplace procedures, product and manufacturing specifications, codes, standards, manuals and reference materials.
- Access to reference materials outlining specific utilisation of PPE.
- Access to recording materials to allow for the reporting of serious faults etc to appropriate personnel.

Site requirements

Appropriate workspace which should include workbenches and vices, tool storage facility.

MEM18002B Use power tools/hand held operations

Assessment of this unit requires that the candidate have access to all tools, equipment, materials and documentation indicated below. In the case of this compulsory HSC unit, please check HSC Requirements and Advice column in Part B of the Board of Studies syllabus for any specified range of resources and equipment.

Tools, equipment and resources

- Power tools *may include* various power tools, including but not limited to, electric or pneumatic/hydraulic drills, grinders, jigsaws, nibblers, cutting saws, sanders, planers, routers, pedestal drills, pedestal grinders.
- Clamping devices *may include* but are not limited to multigrips, vices, jigs and fixtures, clamps.
- Access to reference materials outlining Standard Operating Procedures for a range of power tools including alignment, adjustment, clamping, starting up and shutting down.
- Access to reference materials outlining routine operational maintenance procedures and storage for power tools.
- Manual and electronic recording devices.

Site requirements

Appropriate workspace

Resources for elective competencies in the 120 / 240 hours courses

Assembly

MEM03001B Perform manual production assembly

Assessment of this unit requires that the candidate have access to all tools, equipment, materials and documentation indicated below. Where reference is made to a range of resources and equipment, these must reflect what is typical of manufacturing, engineering and related environments.

Tools, equipment and resources

- Access to reference materials outlining various modes of communication to receive work instruction including verbal, written communication and non-verbal.
- Access to reference materials that outline a range of assembly equipment including name, characteristics, use, limitations, hazard controls, maintenance.
- Materials to record/input production data, specifically electronic and/or manual record/input methods including production schedules, job sheets, checklists.
- Parts that make up the sub-assembly and components
- Materials to create and amend manual and/or electronic records such as production schedules, job sheets and where the selection and use of tools is required as part of the assembly process, see Unit 18.1 (Use hand tools) and Unit 18.2 (Use power tools/hand held operations) as appropriate.

Site requirements

Appropriate workspace

MEM03003B Perform sheet and plate assembly

Assessment of this unit requires that the candidate have access to all tools, equipment, materials and documentation indicated below. Where reference is made to a range of resources and equipment, these must reflect what is typical of manufacturing, engineering and related environments.

Tools, equipment and resources

- Access to reference materials detailing joining techniques and quality assurance
- Access to reference materials detailing issues related to storage/ handing of assemblies/ fabrications
- Jigs, fixtures and other appropriate tools
- A range of commonly used joining techniques eg. fasteners, seams, rivets etc.

Site requirements

Appropriate workspace

Casting and Moulding

MEM04018B Perform general woodworking machine operations

Assessment of this unit requires that the candidate have access to all tools, equipment, materials and documentation indicated below. Where reference is made to a range of resources and equipment, these must reflect what is typical of manufacturing, engineering and related environments.

Tools, equipment and resources

- Access to reference materials detailing specifics of using and maintaining woodworking machinery
- Access to reference materials specifying expected sizes and tolerances commonly used in woodworking
- Recording and calculating devices such as calculator
- Band saws, buzzers, thicknessers, disk sander, bobbin sander, pattern mill, wood lathe, pedestal router and drill
- Blades, router bits
- Fixed and variable guards and stops

Site requirements

Appropriate workspace

Fabrication

MEM05003B Perform soft soldering

Assessment of this unit requires that the candidate have access to all tools, equipment, materials and documentation indicated below. Where reference is made to a range of resources and equipment, these must reflect what is typical of manufacturing, engineering and related environments.

Tools, equipment and resources

- Access to reference materials detailing soft soldering procedures and techniques including effect on materials
- Manual and electronic recording devices such as calculator and workbooks
- Soldering irons (all types) and direct flame or other heating devices
- Ferrous and non-ferrous materials and reference materials outlining the applications of these fluxes and solders.

Site requirements

Appropriate workspace

MEM05004C Perform routine oxy acetylene welding

Assessment of this unit requires that the candidate have access to all tools, equipment, materials and documentation indicated below. Where reference is made to a range of resources and equipment, these must reflect what is typical of manufacturing, engineering and related environments.

Tools, equipment and resources

- Reference materials outlining appropriate communication skills appropriate to this work environment including symbols and terminology commonly used in metal fabrication and welding
- Reference materials detailing the properties and characteristics of a range of materials and the preparation requirements of these
- Reference materials detailing joint specifications, welding and post-weld treatments.
- Mild and low carbon steel and cast iron
- Hoses, blowpipes, regulators
- Filler rods, fluxes
- Fuel gases, including acetylene, LPG, hydrogen etc.

Site requirements

Appropriate workspace

MEM05005B Carry out mechanical cutting

Assessment of this unit requires that the candidate have access to all tools, equipment, materials and documentation indicated below. Where reference is made to a range of resources and equipment, these must reflect what is typical of manufacturing, engineering and related environments.

Tools, equipment and resources

- Access to reference materials which detail mechanical cutting methods and procedures.
- Access to reference materials outlining various modes of work appropriate communication.
- Guillotines, croppers, cold saws, band saws, automatic saws etc.
- Tooling to suit guillotines, croppers, cold saws, band saws, automatic saws etc.
- All safety equipment/stops/guards on guillotines, croppers, cold saws, band saws, automatic saws etc.
- Ferrous and non-ferrous metals and non-metallic products
- Access to a range of measuring instruments and reference materials outlining measuring and recording standards.

Site requirements

Appropriate workspace

MEM05006B Perform brazing and/or silver soldering

Assessment of this unit requires that the candidate have access to all tools, equipment, materials and documentation indicated below. Where reference is made to a range of resources and equipment, these must reflect what is typical of manufacturing, engineering and related environments.

Tools, equipment and resources

- Access to reference materials outlining standard silver soldering processes and procedures
- Access to reference materials outlining various modes of work appropriate communication
- Oxy acetylene and fuel gas, cylinders, connections, hoses, tips and nozzles
- Fluxes (resin or powder), all types of silver solder and brazing grades, etc.

Site requirements

Appropriate workspace with adequate ventilation

MEM05007C Perform manual heating and thermal cutting

Assessment of this unit requires that the candidate have access to all tools, equipment, materials and documentation indicated below. Where reference is made to a range of resources and equipment, these must reflect what is typical of manufacturing, engineering and related environments.

Tools, equipment and resources

- Access to reference materials outlining standard heating and cutting processes and procedures, especially safety procedures
- Access to reference materials outlining various modes of work appropriate communication
- Appropriate measuring instruments
- Hand held and self-propelled straight line cutters
- Fuel gas, oxy fuel gas and air fuel gas
- Various thicknesses and types including ferrous, non-ferrous and non-metallic materials

Site requirements

Appropriate workspace

MEM05012C Perform routine manual metal arc welding

Assessment of this unit requires that the candidate have access to all tools, equipment, materials and documentation indicated below. Where reference is made to a range of resources and equipment, these must reflect what is typical of manufacturing, engineering and related environments.

Tools, equipment and resources

- Access to reference materials which detail appropriate material and equipment processes and preparation
- Access to reference materials outlining various modes of work appropriate communication
- Measuring instruments appropriate to measure a range of consumables
- Low and mild carbon steel or similar
- Welding leads, welding machines, electrode holder etc.

Site requirements

Appropriate workspace with adequate ventilation

MEM05050B Perform routine gas metal arc welding

Assessment of this unit requires that the candidate have access to all tools, equipment, materials and documentation indicated below. Where reference is made to a range of resources and equipment, these must reflect what is typical of manufacturing, engineering and related environments.

Tools, equipment and resources

- Access to reference materials which specify materials preparation and processes, as well as expected current and voltage settings.
- Access to reference materials outlining various modes of work appropriate communication
- Mild and low carbon steel
- Hoses, welding leads, welding machines, gas shrouds, gas regulators, liners, contact tips
- Filler wire, shielding gas

Site requirements

Appropriate workspace with adequate ventilation

MEM05051A Select welding processes

Assessment of this unit requires that the candidate have access to all tools, equipment, materials and documentation indicated below. Where reference is made to a range of resources and equipment, these must reflect what is typical of manufacturing, engineering and related environments.

Tools, equipment and resources

- Access to reference materials which define uses and purposes of various metals, as well as their properties and characteristics
- Access to steel suppliers handbooks, welding company materials, standard operating procedures, and safety documentation.
- Stainless steel, aluminium, galvanised metals, carbon steel, copper, manganese, zinc
- Steel suppliers handbooks, welding company materials, standard operating procedures, safety documentation

Site requirements

Appropriate workspace

MEM05052A Apply safe welding practices

Assessment of this unit requires that the candidate have access to all tools, equipment, materials and documentation indicated below. Where reference is made to a range of resources and equipment, these must reflect what is typical of manufacturing, engineering and related environments.

Tools, equipment and resources

A range of reference sources which may include

- National Occupational Health and Safety Commission guidelines
- Organisational OH&S practices and procedures manuals
- Australian/New Zealand and ISO standards
- Company risk management policy
- Codes of practice
- Australian dangerous goods legislation
- Trade practices
- Occupational Health and Safety reporting requirements
- Weld procedures
- Standard operating procedures
- Material safety data sheets (MSDSs)
- Job sheets
- Emergency procedures
- Safety standards and procedures

Personal Protective Equipment (PPE) such as

- Respirators
- Ear muffs
- Protective clothing
- Gloves
- Boots
- Helmets
- Eye protection
- Face shields

Site requirements

Appropriate workspace

Machine and Process Operations

MEM07032B Use workshop machines for basic operations

Assessment of this unit requires that the candidate have access to all tools, equipment, materials and documentation indicated below. Where reference is made to a range of resources and equipment, these must reflect what is typical of manufacturing, engineering and related environments.

Tools, equipment and resources

- Access to reference materials which define uses and purposes of workshop machines, as well as their properties and characteristics
- Digital and manual measuring instruments
- Access to reference materials outlining various modes of work appropriate communication
- Access to reference materials which outline appropriate application of a range of tooling for basic machining of engineering components.
- Lathe, radial arm drill, mill etc.
- Ferrous and non ferrous metal stock
- Chucks, vices, clamps, bars and packing etc.

Site requirements

Appropriate workspace

Materials Handling

MEM11011B Undertake manual handling

Assessment of this unit requires that the candidate have access to all tools, equipment, materials and documentation indicated below. Where reference is made to a range of resources and equipment, these must reflect what is typical of manufacturing, engineering and related environments.

Tools, equipment and resources

- Hand trolleys, wheelbarrows, motorised/hand pallet trucks (not sit on), scissor lifts, boom lifts, hand carts, dedicated production or process lifting equipment such as baskets, spreader bars, cradles or the like attached to lifting equipment
- Access to reference materials that outline techniques for determining material weight
- Measuring instruments appropriate to measure a range of consumables

Site requirements

Appropriate workspace

Measurement

MEM12001B Use comparison and basic measuring devices

Assessment of this unit requires that the candidate have access to all tools, equipment, materials and documentation indicated below. Where reference is made to a range of resources and equipment, these must reflect what is typical of manufacturing, engineering and related environments.

Tools, equipment and resources

- Linear measuring devices measuring to within 1mm graduation – should include rules, tapes and retractable tapes
- A range of gauges common to the industry which may include Go/no-go devices, thread angle and taper gauges, temperature gauges, pressure gauges, measuring gauges and overlay indicators, templates, digital devices and pre-set verniers and micrometers

Site requirements

Appropriate workspace

Communication

MEM16005B Operate as a team member to conduct manufacturing, engineering or related activities

Assessment of this unit requires that the candidate have access to all tools, equipment, materials and documentation indicated below. Where reference is made to a range of resources and equipment, these must reflect what is typical of manufacturing, engineering and related environments.

Tools, equipment and resources

- Access to reference materials outlining various modes of work appropriate communication.

Site requirements

Appropriate workspace

MEM16006A Organise and communicate information

Assessment of this unit requires that the candidate have access to all tools, equipment, materials and documentation indicated below. Where reference is made to a range of resources and equipment, these must reflect what is typical of manufacturing, engineering and related environments.

Tools, equipment and resources

- Job instructions, specifications, standard operating procedures, charts, lists, documents, computer data, drawings, sketches, tables, technical manuals and/or charts and other applicable reference material

Site requirements

Appropriate workspace

MEM16008A Interact with computing technology

Assessment of this unit requires that the candidate have access to all tools, equipment, materials and documentation indicated below. Where reference is made to a range of resources and equipment, these must reflect what is typical of manufacturing, engineering and related environments.

Tools, equipment and resources

- Hand held data recording devices, screen based equipment, personal computers, bar coders
- Word processing spreadsheets and databases
- Customised engineering and manufacturing applications
- Material Resource Planning (MRP)
- Warehousing inventory applications
- Predictive reliability and maintenance applications
- Production data management applications

Site requirements

Appropriate workspace

Maintenance and Diagnostics

MEM18055B Dismantle, replace and assemble engineering components

Assessment of this unit requires that the candidate have access to all tools, equipment, materials and documentation indicated below. Where reference is made to a range of resources and equipment, these must reflect what is typical of manufacturing, engineering and related environments.

Tools, equipment and resources

- A range of component parts found in equipment or product assemblies, sub-assemblies, e.g. couplings, universal joints, pumps etc. employing shafts, pre-manufactured bearings and seals, lubricants, fasteners, gaskets etc.
- A range of hand and power tools, bearing pullers, special purpose dismantling and assembly tools etc.
- Measuring equipment

Site requirements

Appropriate workspace

Resources for elective competencies in the 60 / 120 hours specialisations

The content and resource requirements of all units of competency in the specialisations are available for download from the National Training Information Service website at <http://www.ntis.gov.au/>.

Quality assurance requirements

The implementation of HSC VET courses must be monitored to ensure compliance with the Australian Quality Training Framework (AQTF) and the Board of Studies HSC requirements.

The following checklists have been designed to assist schools in this process:

- Teacher qualifications
- Student work placement
- Student assessment
- Resources/equipment

The checklists have been designed to be photocopied and completed by teachers implementing this course. Checklists for resources/equipment must be completed for both core and elective strands. Principals should use these checklists to monitor the implementation of HSC VET courses to ensure compliance with AQTF and the Board of Studies HSC requirements.

It is the responsibility of the principal to complete the following forms and forward them to the School Education Director

- Checklists for the Metal and Engineering industry curriculum framework to be delivered in that year
- Principal's Confirmation of Quality Assurance Requirements (see General Information: Appendix 1)
- Monitoring Higher School Certificate Requirements (distributed to schools in February each year)

In addition, at the start of each year as part of the Board of Studies student entry requirements, schools are required to indicate via Schools On-line the qualification and units of competency that each student will be undertaking in the current calendar year and generating the Confirmation of VET Competencies report. This requires the completion of the *competencies entered* component of the eBOS-VCS. At the end of each year schools are responsible for entering for each student, via Schools On-line, the outcome of each unit of competency entered (using the Competency Outcomes shown in the list below). This information will be used to generate an AQF Statement of Attainment or Certificate and enables school-based RTOs to comply with reporting requirements.

Competency Outcomes

Outcome	Explanation
Achieved	Student has completed the unit of competency and has been assessed as competent in all elements.
Continuing	Student is enrolled in the unit of competency and training has commenced, however the final assessment for the unit will be conducted in the next calendar year. Note: If assessment was conducted in the same calendar year as the enrolment and the student was not competent, then a result of 'Competency not achieved' should be recorded. If the student attempts the unit of competency again in the next calendar year a new enrolment should be recorded.
Credit Transfer	Student has been awarded a recognised credential in the unit of competency at the same or another RTO and has provided evidence of this.
Not Achieved	Student has been assessed and is not competent in one or more elements of the unit of competency.
Did Not Start	Student was enrolled in the unit of competency, but training for the unit was not commenced.

Outcome	Explanation
Recognition of Prior Learning	Student has been assessed as competent for the whole unit of competency as a result of recognition of prior skills and knowledge.
Withdrawn	Student commenced training in the unit of competency but has withdrawn from the unit before assessment has been completed.